ATTO Accelerates Virtual Storage Management
Increasing Efficiency in the Data Center

Businesses are increasingly turning to server virtualization to make efficient use of hardware resources, reduce operating costs and provide flexibility for maintenance and disaster recovery. According to The Gartner Group, as of 2014 over 50 percent of server workloads have been virtualized using solutions such as VMware's VSphere. One challenge IT administrators working within virtualized environments face is migrating a virtual machine (VM) transparently and without interruption to the users. These migrations occur frequently when adjusting workloads, planning for system maintenance, or recovering from an unexpected network issue. Administrators need to get VMs running with as little impact on overall network capacity as possible.

Migration of VMs is one challenge that VMware's Storage vMotion, a feature in VSphere 5.5, effectively addresses. With Storage vMotion, VMs can be transferred live with continuous service availability and full data retention. A less certain factor when migrating virtual machines is the network connection between the physical server and storage. The heavy I/O operations and large queue depths demanded by VM migrations present significant challenges to an adapter as well as the storage, which must rapidly transfer data from one host to another to ensure an uninterrupted workflow.

ExpressSAS and Storage vMotion

Achieving the most efficient VM migration requires responsive infrastructure. High-performance storage, including low latency disk storage, is critical. Additionally, the data pipe provided by the HBA needs to efficiently handle both large and small block transfers, including very deep queues. ATTO ExpressSAS 12Gb HBAs complement Storage vMotion by enabling VM migrations to be accomplished more seamlessly than the leading competitor.
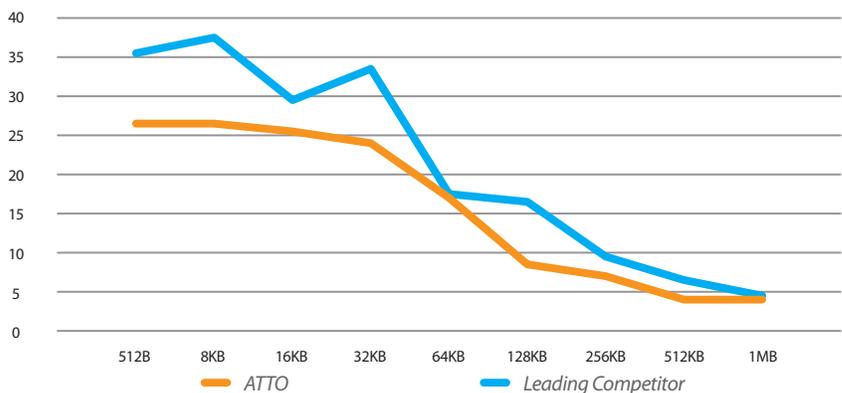
In a comparative test, ATTO's HBA was able to transfer VMs from a data store consisting of high-performance Toshiba HDDs (MG035SCA400) to a second, identical data store with 37% higher sustained throughput (MB/s) and IOPs than a leading competitor. Perhaps more significantly, ATTO achieved higher performance while utilizing fewer CPU resources, meaning that those resources would be available for the business needs of end users. The significant throughput advantages delivered by ExpressSAS 12Gb HBAs provide the assurance that VMs, with the right hardware infrastructure choices, can be migrated with zero downtime and disruptions.

The performance advantages of ATTO 12Gb HBAs in a virtualized environment can have a real impact on businesses. VM migration creates risk by limiting resource availability and also the ability of a system to respond to sudden surges in demand. By enabling VMs to be transported and rapidly brought back online, ATTO reduces the risk of downtime or data loss during migrations.

The low latency and bandwidth advantages provided by ATTO 12Gb HBAs also mean that data center operations won't be slowed down by network congestion. The impact of a VM migration consuming network resources is that those resources then aren't available for critical business functions. By enabling faster, more efficient transfers, ATTO HBAs permit companies to quickly return to peak business operation.

% CPU Utilization
100% Seq. Read, QD 4

Legend: ATTO, Leading Competitor

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Test Method

Both the ATTO H1280 12Gb ExpressSAS HBA and the competitor's HBA were tested under the following conditions: vCenter server running Vmotion; SuperMicro X9 storage server; twelve Toshiba MG035SCA400 SAS HDDs. The Toshiba drives were used to create twelve independent VMware data stores, with two virtual machines assigned to two of the twelve data stores. One VM was used to hold a variety of file types on data store 1. Storage vMotion was then used to migrate that data to data store 2. During the migration, the performance of the second VM was monitored as it simultaneously ran I/O to all twelve data stores. This method was designed to mimic movement of a data store while continuing to provide users with access to key applications.

Conclusion

When it comes to carrying out VM migration using Storage vMotion, faster time to data means reduced downtime and network congestion. ATTO's ExpressSAS 12Gb HBAs deliver the necessary low latency and high bandwidth to execute tasks such as live VM migration with full data integrity and zero downtime. In doing so, ATTO enables businesses to take advantage of the cost-saving benefits of virtualization while maintaining consistent peak data center performance.

vCenter Server Windows 2012
Used to control Storage vMotion

ESXi 5.5 Hypervisor Server

VM Windows 2012

VM RHEL 6.5

SAS RAID Storage Array

datastore 1   datastore 2

Storage vMotion from datastore 1 to datastore 2